

SoilHOMC Model: Soil Heating and Organic Matter Combustion Model

Model Input-Output guide

1. Model inputs:

The model input file must be a text file, of any extensions, with 13 lines as follows:

- 1 File name (The name before the extension will define the model's name)
- a. Soil description:
 - 2 Sand weight fraction (g/g)
 - 3 Clay weight fraction (g/g)
 - 4 Bulk density (kg/m³)
 - 5 Volumetric pore radius (mm) [Recommended: 1.5 mm]
 - 6 Initial temperature (°C)
 - 7 Initial volumetric water content (cm³/cm³)
 - 8 Initial SOM content (g/g)
- b. Wildfire description:
 - 9 Wildfire surface temperature (°C)
 - 10 Exposure time (h)
- c. Simulation parameters:
 - 11 Soil depth (m)
 - 12 Cell size (m)
 - 13 Time stability corrector (-)

2. Model outputs

The model has two outputs: (1) Soil temperature (.T extension), in °C, and (2) SOM content (.SOM extension), in g/g. The outputs are written in separated binary files. Each binary file contains three main set of values: (1) nx and nt (number of elements and time steps), (2) dx and dt (node spacing and time step), and (3) a vector array for the corresponding output. The vector array must be reshaped to (nt,nx) in Fortran-like index order. In this way, each row of the array represents the time series at a specific depth of the modeled soil profile, and each column represents the soil profile (T or SOM) at a specific time.